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(54) Title: ELECTRO-OPTICAL NUCLEIC ACID-BASED SENSOR ARRAY AND METHOD FOR DETECTING ANALYTES

(57) Abstract: The present invention is directed to methods of detection, identification and monitoring of vapor phase analytes by using sensor arrays comprising fluorophore labeled nucleic acids, dried onto a substrate which react with vapor phase analytes. Methods of using and preparing such sensor arrays are also provided.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/38186

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C12M 1/34; G01 N 33/543, 33/551

US CL : 422/82.06, 82/08; 436/172

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 422/82.06, 82/08; 436/172

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
STN on line

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	US 6,649,403 B1 (MCDEVITT et al) 13 November 2003.	1-8,10-18
A	Database Caplus on STN. DN 134:175042. STOJANOVIC et al. "Fluorescent Sensors Based on Aptamer Self-Assembly". Journal of the American Chemical Society, 2000, Vol. 122, No. 46, pages 11547-11548	1-8, 10-18

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

26 November 2004 (26.11.2004)

Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/38186

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-8,10-18

Remark on Protest

☐
☐

- The additional search fees were accompanied by the applicant's protest.
No protest accompanied the payment of additional search fees.

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

Group I, claims 1-8, and 10-18 (al in part), drawn to method for detecting analyte in air sample.

Group II, claims 9 and 10-18 (al in part), drawn to method of selecting nucleic acids.

Group III, claims 19-27, drawn to a sensing system.

The inventions listed as Groups I, II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Each of the Groups claims a distinct and separate method (Gr. I - for detecting analyte in air sample; Group II - method of selecting nucleic acids). The methods do not share a special technical feature because each method contains specific and unique method steps which are not shared by each of the other methods and each method has a unique and distinct outcome. Thus, groups I,II do not share a corresponding special technical feature.

The inventions listed as Groups I,III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I is the technical feature that links Groups I and III. Group I is not the contribution over the prior art because it is suggested by references teaching nucleic acid sensors, such as Stojanovic et al (Database CAPLUS, DN 134:175042. Fluorescent Sensors Based on Aptamer Self-Assembly. Journal of the American Chemical Society (2000), 122(46), 11547-11548) Therefore, the lack of unity is present because the linking technical feature is not a "special technical feature" as defined by PCT Rule 13.2.